

Functional Annex A:
DIRECTION AND CONTROL

MISSION

- A. During normal operations, to establish an Emergency Operations Center (EOC) from which the Governor, or his designee, can direct and control emergency operations statewide. Detailed procedures for Virginia Emergency Operations Center (VEOC) operations must be developed and maintained. An ongoing training program must be provided for the Virginia Emergency Response Team (VERT), and adequate facilities and equipment must be provided.
- B. When a tropical cyclone is threatening coastal Virginia, or the remnants of a tropical cyclone which made landfall along the Gulf coast and is tracking into inland Virginia, the VEOC monitors the situation and will be augmented accordingly. The VEOC will be staffed to collect information, review status of pre-landfall protective actions, produce the required reports and coordinate requests for assistance from local governments. A “State EOC Procedures Manual for Emergency Operations” (EOC SOP) is published separately. It serves as the basis for VEOC training activities as well as for response operations.

ORGANIZATION

- A. The state response to the event will be under the direction of the State Coordinator, who reports directly to the Governor or designee. The supporting VEOC staff will consist of the VERT.
- B. Emergency operations must be compatible with the National Response Plan and the DHS/FEMA Regional Response Plan (Region III). In the event of a hurricane, federal staff and resources may be available to augment and supplement state and local emergency operations. DHS/FEMA Headquarters will designate a Principle Federal Official (PFO).

CONCEPT OF OPERATIONS

- A. In the event of a hurricane, the Governor will issue an Executive Order authorizing the use of state resources to supplement the efforts and resources of local governments and relief organizations in preventing or alleviating the damage, loss and hardship when it is evident that the situation is beyond their capability or expertise. Local governments shall implement their Emergency Operations Plan as needed in order to protect public safety and property.

- B. The VEOC will disseminate the issuance of an Executive Order to the Governor's Cabinet, state agency directors, state agencies, VDEM staff, and local government via established communications pathways.
- C. The VEOC must respond effectively to developing events. When severe weather events are developing, the communications center will monitor the situation and disseminate appropriate weather information on a continuous basis to the Governor's Cabinet, state agency directors, state agencies, VDEM staff, and local governments as prescribed in guidance documents and procedures.
- D. The VDEM Hurricane Program Manager will relocate to the VEOC at Readiness Condition 4. The Hurricane Program Manager will make preparation to provide technical planning guidance and assistance with evacuation decisions using HURREVAC 2000, hurricane tracking models and other tools.
- E. The VEOC will conduct conference calls with National Weather Services, state agencies, and local governments to discuss the weather forecast (i.e., storm arrival and potential impact) and operational issues, including evacuation and sheltering. Daily situation reports must be provided by each affected local EOC to the VEOC. Radio Amateur Civil Emergency Services (RACES) will serve as an alternate or backup means of communications between the VEOC and affected localities' EOCs.
- F. The VDEM Mobile Command Post may be available and deployed as needed for on-scene emergency operations and/or communications purposes.
- G. After the impact, if local government is unable to provide the capability and expertise to effectively manage the event, the VEOC shall coordinate request(s) for state assistance. Should the event be beyond the capability of the state to respond, the VEOC will coordinate with DHS/FEMA for federal assistance to the impacted area.
- H. In a joint venture between DHS/FEMA, the State and local governments, VEOC will deploy Preliminary Damage Assessment (PDA) Teams to document the impact on individuals, families, businesses and public property.
- I. During recovery operations, the major activity will shift to a forward location near the impacted area in order to more effectively support state and local recovery. When this occurs, previously-designated VEOC staff and other state and volunteer agencies will deploy to the forward operating location which is usually located in the Joint Field Office (JFO). As responsibility for recovery operations is assumed by the JFO staff, the VEOC activities will be scaled down accordingly, returning to normal operations as soon as possible.
- J. The Joint Information Center (JIC), when established, will coordinate all public news releases.

- K. In order to assure the operational capability of the VEOC, periodic tests and exercises will be conducted to test the validity of plans and procedures, to provide training for the VERT and to test the adequacy of facilities and equipment. An after-action report identifying specific corrective actions will be prepared after each exercise.

DIRECTION AND CONTROL DECISION PROCESS

Condition 5: Routine Operations

1. VDEM Hurricane Program Manager (HPM) will develop and maintain the Hurricane Incident Annex to the COVEOP.
2. VDEM Director of Operations will develop and maintain VEOC SOP that provides for VEOC operations.
3. VDEM Information Technology staff will maintain an in-house capability to use computer-aided hurricane tracking and evacuation decision tools and programs.
4. VDEM Hurricane Program Manager provides training for VEOC staff and the Virginia Emergency Response Team (VERT), as needed.
5. VDEM Communications staff will monitor and track named or numbered tropical systems and update data into HURREVAC.
6. The VDEM Director of Operations will develop a detailed staffing plan for the VERT for augmentation of the VEOC if needed for activation.

Condition 4: Forecasted Arrival of Tropical Storm Force Winds, 120 to 72 Hours (D-5 to D-3 Days)

1. HPM will alert the Director of Operations and other key personnel when a named tropical system has developed and has the potential to impact the Commonwealth.
2. HPM reports to the VEOC and begins analyzing “what-if” scenarios necessary to justify recommendation to senior management and the Governor.
3. The Director of Operations and HPM will participate in DHS/FEMA video-teleconferences with Hurricane Liaison Team for updated hurricane track projections.
4. HPM will establish communications with National Weather Service; ESF 2 & 3 Chiefs will establish communications with public utilities through the SCC and VITA, the VDOT EOC and other sources of information as needed.
5. The VERT Coordinator will augment the VERT to match the Federal staffing response to the VEOC.
6. HPM will review and implement the Hurricane Emergency Response Annex.
7. The VERT Coordinator will prepare for the arrival of the DHS/FEMA Federal Incident Response Support Team (FIRST) at the VEOC.

8. The Deputy VERT Coordinator will review and finalize internal procedures for message handling, tracking expenses and the Online EOC. Begin documentation procedures and assign an event name to WebEOC.
9. VEOC Communications Officer and VERT Planning Section Chief will establish connection with the Homeland Security Information Network (HSIN) to coordinate Federal/State/Local information sharing and development of a Common Operational Picture (COP) for response operations.
10. The VERT Coordinator will prepare for the arrival of the DHS/FEMA ERT-A at the VEOC to coordinate and assist federal disaster relief officials as needed.
11. VERT Logistics Chief will prepare for the federal identification and establishment of Mobilization Center and Staging Areas for commodities.
12. VERT Coordinator will alert state agencies and potential host localities along evacuation routes of a possible evacuation and requests status of available sheltering capabilities.
13. VERT Coordinator will initiate requirement that daily Situation Reports be submitted to VERT identifying all available shelter information.
14. VDEM Communications Officer will transmit tropical system advisories to localities via VCIN or other available communication pathways.
15. HPM will establish communications with the National Hurricane Center Liaison Officer.
16. Planning Section Chief will provide a daily situation report to the Office of the Governor, Cabinet and Agency heads, DHS/FEMA, state agencies and localities, and private and volunteer organizations.
17. VERT Coordinator will ensure funding is available for VEOC staff logistical items.
18. VDEM Communications Officer will bring RACES to Level One (notification) status.
19. VERT Logistics Chief will check Agency vehicles to ensure they are ready for response.
20. VDEM PIO activates its media plan to ensure public notification.
21. VERT External Affairs will develop staffing plan for the Virginia Public Information Center (VPIC).
22. VERT Coordinator will prepare for the arrival of the DHS/FEMA JFO staff with PFO/FCO.

23. VERT Coordinator will augment predetermined state staffing resources to match DHS/FEMA County Liaison representatives for projected impacted localities.
24. VDEM Communications Officer will contact VITA to request Conference Bridge. Initiate conference call procedures with state agencies.
25. Continue/complete all Condition 5 activities.

Condition 3: Forecasted Arrival of Tropical Storm Force Winds, 72 to 48 Hours (D-3 to D-2 Days)

1. The State coordinator or Deputy State coordinator will notify the ESF #14 Chief – Recovery, to draft an executive order for the Governor.
2. State Coordinator will notify the Office of the Governor of the current situation and request the Governor issue an executive order, declaring a State of Emergency in anticipation of the mobilization of VSP and National Guard resources at 48 hours with voluntary evacuation authority. Notify Chief Deputy State Coordinator and Deputy State Coordinator of current situation.
3. VERT Coordinator will request situation report from all localities undertaking major preparatory actions (declaring local emergency, evacuations, opening local EOC, sheltering), and/or encountering problems.
4. HPM will coordinate traffic issues, the Hampton Roads Hurricane Traffic Control Plan, and verify timeframes with VDOT, VSP, and National Guard in anticipation of one or more of the following evacuation plans:
 - a. Phase One Evacuation
 - b. Phase Two Evacuation
 - c. Mandatory Lane Reversal (Contra Flow)
5. ESF #6 Mass Care, will coordinate with host shelter localities/facilities, as needed due to the level of the threat.
6. VDEM Communications Officer will contact VITA to request Conference Bridge. Initiate conference call procedures with National Weather Service, at-risk localities, and state agencies.
7. HPM will establish communications with North Carolina EOC to exchange evacuation status and anticipated actions.

8. VDEM Communications Officer will bring RACES to Level Two (standby) status. Ensure VEOC RACES equipment is prepared for operations.
9. DHS/FEMA DCO, PFO and FCO are in place.
10. DHS/FEMA ESFs provided authority to plan operations with state (VERT ESFs) i.e. USACE critical infrastructure and debris removal plans.
11. When the Governor declares a State of Emergency, the State Coordinator will notify State Agency Directors, State Agencies, and all state localities and DHS/FEMA. The State Coordinator will contact VSP, National Guard, and VDOT at 48 hours to mobilize for the potential to evacuate.
12. VDEM Communications Officer and VERT Planning Section Chief will test HSIN connectivity and protocols for COP.
13. Continue/complete all Condition 4 activities.

Condition 2: Forecasted Arrival of Tropical Storm Force Winds, 48 to 24 Hours (D-2 Days to D-1 Day)

1. VERT Coordinator will augment the VEOC to full operational status. Staff all major functions not previously staffed.
2. Governor to declare and convey mandatory evacuation authority, as may be necessary.
3. State Coordinator to establish Unified Command with DHS/FEMA staff at VEOC.
4. VDEM Communications Officer will bring RACES to Level Three (deployment) status to VEOC and DHS/FEMA Region III Coordination Center for operations.
5. At 48 hours the State Coordinator will advise VSP, National Guard and VDOT to preposition for evacuation. The State Coordinator will advise the Office of the Governor, Secretary of Public Safety and the Office of Commonwealth Preparedness.
6. Between 48 and 36 hours, State Coordinator will conduct a conference call to advise the at-risk jurisdictions and key state agencies of the pre-positioning of state resources. Discuss the implementation of Phase One or Lane Reversal Evacuation (See Hampton Roads Hurricane Traffic Control Plan for Phase One localities) at 27 hours with the potential for lane reversal decision that would occur at approximately 30 hours or sooner, if the storm is forecasted to make landfall at Category **3 or higher, or as may be determined based upon the threat to the Commonwealth.**

7. Between 36 and 31 hours, the State Coordinator, after confirming with VDOT, VSP and the VNG will make the recommendation to the Governor for lane reversal if the storm is forecasted to make landfall at Category **3 or higher, or as may be determined based upon the threat to the Commonwealth** and will notify the Governor of the latest data received from the National Weather Service.
8. Between 30 and 28 hours, the VERT Coordinator will confer with the State Coordinator the implementation of Phase One or Lane Reversal Evacuation (see Hampton Roads Hurricane Traffic Control Plan for Phase One localities) and the need for lane reversal if the storm is forecasted to make landfall at Category **3 or higher, or as may be determined based upon the threat to the Commonwealth**. Based on the results of the conference call, the State Coordinator will confer with the Governor and request a decision concerning Phase One evacuation. If the decision is a GO, VDEM PIO activates its media plan to ensure public notification. If the decision is NO, the VEOC will continue to monitor the progress of the storm. State Coordinator will evaluate the level of the VEOC augmentation.
9. The Governor will make the decision on the use of Lane Reversal (Contra Flow) prior to **29 hours**, if the storm is forecasted to make landfall at Category **3 or higher, or as may be determined based upon the threat to the Commonwealth**. If the Governor's decision is Yes, implement **Mandatory Lane Reversal Evacuation at 27 hours**, or as may be feasible. Immediately advise VSP, VDOT and the VNG to begin procedures to shut down I-64 eastbound for westbound traffic. Advise localities via VCIN or other means with confirmed response. It is recommended that Mandatory Lane Reversal not begin during hours of darkness.
10. At **28 hours**, the VERT Planning Section Chief will conduct a conference call with localities and state agencies to advise of the Governor's decision regarding **Mandatory Lane Reversal**. Notify localities to identify and staff "refuges of last resort", if necessary. Discuss the necessity of **Phase Two Evacuation** (See Hampton Roads Hurricane Traffic Control Plan for Phase Two localities) at 14 hours if required. VDEM PIO to utilize its media plan to ensure public notification.
11. VERT Planning Section Chief will advise North Carolina EOC of Governor's **Mandatory Lane Reversal Evacuation** decision.
12. At 27 hours VDOT will implement Phase One or Lane Reversal Evacuation as may be authorized. The State Coordinator will advise the Office of the Governor, Secretary of Public Safety and the Office of Commonwealth Preparedness. The VEOC will advise VSP liaison, VNG liaison, the localities and the North Carolina EOC of the evacuation decision.
13. The VERT Coordinator will check and report on the readiness preparations of selected localities and assure the continued submission of daily situation reports from local EOCs.
14. Continue/complete all Condition 3 activities.

Condition 1: Forecasted Arrival of Tropical Storm Force Winds Within 24 Hours (D-1 Day)

1. Continue to monitor **Phase One or Lane Reversal Evacuation**.
2. Between **17 to 16 hours**, the VEOC will confer with the State Coordinator the implementation of **Phase Two Evacuation** if required. The VERT Planning Section will conduct a conference call with localities and state agencies of the decision to implement **Phase Two Evacuation**, if required. VDEM PIO to utilize its media plan to ensure public notification.
3. At **14 hours**, VDOT will implement **Phase Two Evacuation** as directed. The State Coordinator will advise the Office of the Governor and the Secretary of Public Safety. The VEOC will advise VSP liaison, the National Guard liaison, the localities (via VCIN or other available pathways) and the North Carolina EOC of the evacuation.
4. At **7 hours**, The VERT Coordinator will confer with the State Coordinator regarding the need to stop **Mandatory Lane Reversal Evacuation** and initiate road clearance at 3 hours. The State Coordinator will advise the Office of the Governor and the Secretary of Public Safety. The VERT Coordinator will advise VSP liaison, the National Guard liaison and VDOT EOC and advise the localities via VCIN or other confirmed pathways.
5. At **6 hours**, the VERT Planning Section Chief will conduct a conference call with localities and state agencies and coordinate the preparation to stop **Mandatory Lane Reversal Evacuation** and initiate road clearance at 3 hours before the arrival of tropical storm force winds.
6. At **3 hours**, stop **Mandatory Lane Reversal Evacuation**; VDOT, VSP and VNG resources will initiate road clearance before the arrival of tropical storm force winds. Evacuees still en route will be directed to “refuges of last resort” by local resources where refuges are available.
7. VERT Coordinator will monitor and report on the status of the evacuation to the Governor, Secretary of Public Safety and the Office of Commonwealth Preparedness.
8. Continue/complete all Condition 2 activities.

Landfall: Arrival of Tropical Storm Force Winds – Departure of Tropical Storm Force Winds

1. Continue to monitor the track of the storm.
2. Monitor shelter status.

3. Prepare for resource requests.

Emergency Relief Phase: Life-Saving Operations and the Restoration of Essential Services

1. The VERT will assist with life-saving operations and with the restoration of essential services and facilitate the access of Preliminary Damage Assessment (PDA) Teams and other critical workers to the damaged areas.
2. With the help of federal and state officials within a predetermined timeframe of the passing of the storm, the Operations Chief will conduct an on-site needs assessment of damaged areas.
3. ESF-14 Chief will coordinate PDA process with federal, state and local resources.
4. ESF-14 Chief will complete PDA's that will be the basis for requesting federal disaster assistance.

Note: Although coastal localities and the State EOC will be using these hurricane-specific operations periods, others, to include host localities, will not. They do not have separate hurricane plans and will be using the standard operations periods. (Reference the State EOP.) However, the two checklists are not incompatible.

NON-COASTAL TROPICAL EVENT

(Usually resulting from remnants of a Tropical Cyclone that made landfall along the Gulf.)

When the remnants of a tropical cyclone which made landfall along the Gulf coast is tracking into inland Virginia, the VEOC monitors the situation and will be augmented accordingly. The VEOC will be staffed to collect information, review status of post-landfall protective actions, as may be necessary for the threat, produce the required reports and coordinate requests for assistance from local governments. Under such conditions, forecast or threats for heavy rainfall, major thunderstorm activity and possible tornado activity resulting in possible inland flooding and abnormal wind impacts may cause substantial damage to the Commonwealth. In such cases where Flood Warnings are issued by the National Weather Service, the specific wind thresholds for the implementation of the above Readiness Conditions may not exist. In such cases the VEOC will continue operations at an Increased Readiness level according to the level of threat to the Commonwealth.

ACTION TIMELINE *

Key Action Time/ Forecast Accuracy - Nautical Miles		<u>PHASED EVACUATION</u>	<u>LANE REVERSAL EVACUATION</u>
Readiness Condition			
RC 3	Hours/Miles 72 / @ 170 +/-	Governor's State of Emergency Declaration	Governor's State of Emergency Declaration
	48 / @ 125 +/-	VEOC Initiates Prepositioning of State Resources	VEOC Initiates Prepositioning of State Resources (VSP & VNG mobilizes)
	30	Governor's Evacuation Decision Point	Governor's Mandatory Lane Reversal Decision Point
RC 2	27	Mandatory <u>Phased</u> Evacuation Implemented	Mandatory Evacuation w/ <u>Lane Reversal</u> Implemented
		^ Phase One Evacuation Begins (8 Localities)	
	24 / @ 75 +/-		
RC 1	14	^ Phase Two Evacuation Begins (5 Localities)	
	12 / @ 50 +/-		
	3	Start Road Clearance	Start Road Clearance Both East and West
	0	Arrival of Tropical Storm Force Winds	Arrival of Tropical Storm Force Winds

* VNG needs 24 hours from time of notification to link up with VSP in the field.

Annex A, Attachment 1
DIRECTION AND CONTROL
Alerting, Reporting, Warning, Notification, and Communications

GENERAL

State-level reporting, warning, notification and communications are explained in the State EOP, Volume 1: Basic Plan, Annex A through C and in supplemental State EOC procedures. In addition there are several hurricane-specific requirements, which must be considered.

ASSUMPTIONS

- A. There will be an immediate and continuous demand for information needed in the decision-making process.
- B. State agencies and local governments will be the best and most immediate sources of vital information regarding damage assessment and initial response requirements.
- C. There may be delays in acquiring and assimilating the information.
- D. Communications problems, damage, weather, flooding and other environmental factors may restrict situation assessment operations.
- E. The coordination and information gathering process will include key state agencies and local, state and federal governments, depending on the phase of the event (i.e., weather emergency operations, assessment or recovery).

COMMUNICATIONS PATHWAYS

The Virginia Department of Emergency Management has the legal responsibility for the dissemination of essential information relating to severe weather and other potential emergencies that threaten the Commonwealth. The following provide pathways to disseminate this information:

- A. **Virginia Criminal Information Network (VCIN):** VCIN is the primary warning system to local governments. It is a disaster-resistant, secure network with a terminal usually located in a 24-hour dispatch facility or local Public Safety Answering Point in each locality in Virginia. The primary types of messages relayed over the system are:

1. Weather Products (warnings, watches, specific advisories)
 2. Immediate Emergency Information
 3. Time Sensitive Information for Localities
- B. **Mass Facsimile:** Mass facsimile is the primary method of relaying detailed information to state agencies, local jurisdictions, and media outlets concerning:
1. Situation Reports (SITREPS)
 2. Press Releases of Specific Interest
 3. Weather Situations
 4. Other Key Information
- It is also used as an alternate means of communications with local jurisdictions.
- C. **Conference Calls:** The VERT Planning Section Conference Call Coordinator will conduct conference calls with state and federal agencies, voluntary organizations and local jurisdictions to discuss weather forecasts (i.e., storm arrival and potential impact) and operational issues. The conference calls will usually take place twice a day during a disaster or as deemed necessary. The State Warning Point Supervisor or designee will publish a schedule of calls and telephone number, pin number and disseminate this information via VCIN, telephone, or mass facsimile.
- D. **RACES:** The VEOC RACES station is used as an alternate means of communications between local jurisdictions and the state. Information can be relayed by voice and/or data. There are three levels of readiness (notification, standby, and deployment) dependent on the Hurricane Readiness Condition.
- E. **Warning Circuits:** The VEOC Communications Center is equipped with the National Warning System (NAWAS), Virginia Warning System (VAWAS), Washington Area Warning System (WAWAS), and Dominion Virginia Power Instaphone. These systems may be used as an alternate means of communications to transmit or receive information between stations that are subscribers and the state.
- F. **HF Radio:** Selected jurisdictions, VDEM Regional Coordinators, and the VEOC are equipped with HF Radio equipment. This system may be used as an alternate means of communications.
- G. **VDEM Website:** The VDEM web page may be utilized to access situation reports, media releases and links to various agencies to obtain information; however, this information may

not be current. The Online EOC and WebEOC may be utilized by local jurisdictions to send reports (situation and damage) to the VEOC and view latest reports from jurisdictions as desired.

DISSEMINATION

- A. Tropical Cyclone Forecast Advisories are issued by the National Hurricane Center every six hours, but more frequent if the system threatens human population. The Communications Center will monitor and track named or numbered tropical systems and update into HURREVAC.
- B. The VEOC Communications Center will transmit Tropical Cyclone Forecast Advisories data to local jurisdictions via VCIN when the system appears to threaten the Commonwealth of Virginia within 120 hours (5 days).
- C. In the event of VCIN failure, weather warnings will be issued via warning circuit and/or telephone. Significant weather information, such as watches and specific advisories, will be sent via facsimile, telephone, and/or RACES and placed on VDEM web site and WebEOC.
- D. Once issued, situation reports (SITREPS) will be sent by email or mass facsimile to the Governor's Office, Governor's Cabinet, state agency directors, state agencies, and local jurisdictions. Situation reports will also be sent to local jurisdictions via VCIN.
- E. Conference calls will usually be scheduled twice daily. The VEOC will notify state and federal agencies and voluntary organizations by telephone and local jurisdictions by VCIN. The schedule of the conference calls and the telephone number will be provided by the VEOC.
- F. The VEOC Communications Center will establish HF Radio communications with DHS/FEMA Regions I and IV.
- G. In the event of telephone or VCIN failure, information can be received or transmitted by WebEOC, RACES, Warning Circuits, or HF radio.

COLLECTION PROCESS

The Virginia Department of Emergency Management has the responsibility for collecting essential information relating to emergencies and disasters in the Commonwealth. The following provides the methods of collection:

- A. **Status Assessment Reports:** The primary method of receiving local and state agency status reports is facsimile, WebEOC and/or Online EOC. Secondary methods include telephone or

RACES. The Communications Center receives these reports (situation and damage) and refers them directly to the VERT, Planning (ESF-5). The Planning Section collects, analyzes, and displays the information received as an aid in planning response and recovery operations and the preparation of state summary situation reports (SITREPS). The two types of status assessment reports are the situation report, based on the essential elements of information; and the initial damage assessment report and data summary reports, to facilitate the state in asking for federal or other assistance.

- B. **Requests for Assistance:** The primary method for receiving local requests for assistance is via telephone to the VEOC Communications Center and then to the Local Liaison Section. Secondary methods include RACES, VCIN, HF radio or warning circuits. All requests are placed into WebEOC by the Local Liaison and referred to the appropriate Emergency Support Function. The appropriate Branch Chief will track the request for assistance through its completion. All completed requests for assistance will be closed in the WebEOC by the Emergency Support Function (ESF).

SPECIFIC WEATHER PRODUCTS

The following are brief descriptions of NWS weather products disseminated by VEOC:

- A. **Watch:** A potential for the specified type of severe weather (i.e., flash flood, tornado, severe thunderstorm) in a defined area.
- B. **Warning:** Conditions are imminent for the specified type of severe weather in a defined area.
- C. **Tropical Cyclone Forecast/Advisory:** Issued by the National Hurricane Center every six hours, or more frequently if human population is threatened. This information provides wind field information, direction and speed of the tropical cyclone. Wind speeds are in knots (nautical miles per hours), distance in nautical miles, and times in Coordinated Universal Time (UTC) as opposed to local time. This information is to be used in the HURREVAC model for tracking and for “what-if” risk analyses.

CONFERENCE CALL PROCEDURES

PURPOSE

Conference calls will be conducted usually twice per day or as deemed necessary, to discuss weather impact and operational issues. The duration of the conference call should not exceed one hour. Attendees will include the VEOC, state agencies, voluntary organizations, affected local jurisdictions, and the National Weather Service.

AT LEAST ONE HOUR PRIOR TO THE SCHEDULED CONFERENCE CALL

- A. The State Warning Point supervisor or designee will notify National Weather Service, VDEM Staff, State agencies and Voluntary Organizations by email, VCIN and/or fax, 2-3 hours prior to the call. The VEOC will provide the time of the conference call and the telephone number being used.
- B. The SWP will send a VCIN to affected local jurisdictions advising of the time of the conference call, telephone number being used and agenda. The VCIN message should state: **RELAY TO EMERGENCY SERVICES COORDINATOR**. Secondary means of notification include telephone and mass facsimile.
- C. The VEOC Communications Center will transmit tropical Cyclone Forecast Advisory Data via VCIN to affected local jurisdictions. If available, the latest weather data (i.e., tidal information, special weather statements, and coastal flood statements) may be posted on the VDEM web site. The Emergency Services Coordinators should review this information prior to the scheduled conference call.

CONFERENCE CALL PROCEDURES

- A. Conference calls will be moderated by the VERT Planning Section Conference Call Coordinator. A roll call will be conducted by the Conference Call Coordinator prior to starting the conference call to determine attendance. Participants **will not** use cellular telephones due to noise interference. Participants should mute their speakerphones during the conference call to reduce noise interference.
- B. The conference call will begin with the National Weather Service discussing the potential impact of the storm. Participants are encouraged to review National Weather Service products for detailed information specific to their locality before or after the conference call.

- C. After the weather briefing, the Conference Call Coordinator will coordinate operational issues and discuss evacuation procedures and the undertaking of major preparatory actions with the local jurisdictions.
- D. After discussing issues with Local jurisdictions, the VEOC will coordinate operational issues with State agencies. At this time, the Local jurisdictions may elect to terminate participation on the conference call.
- E. At the conclusion of the conference call, the Conference Call Coordinator will advise the participants of the time of the next conference call.

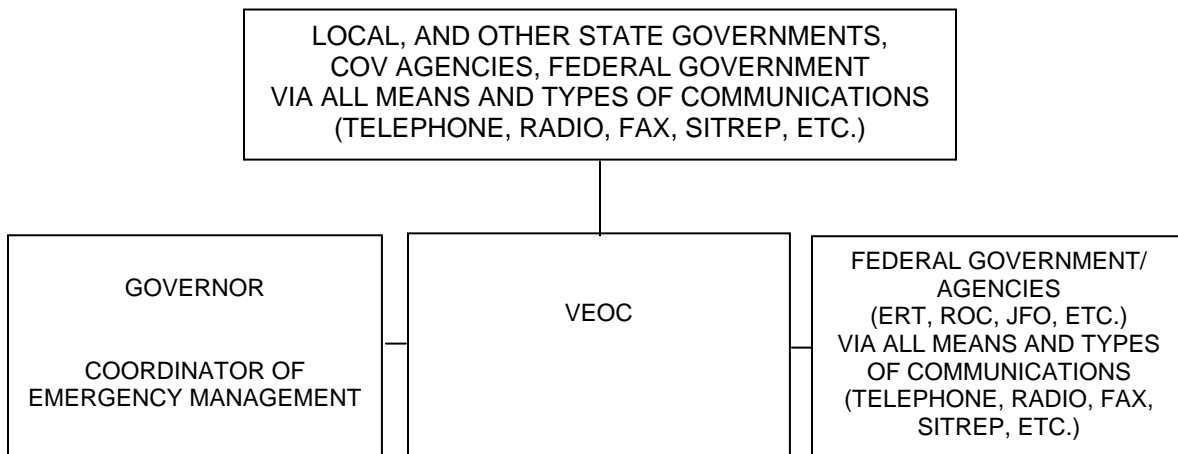
CONFERENCE CALL SCHEDULE

If applicable, the conference call schedule concerning evacuation is as follows:

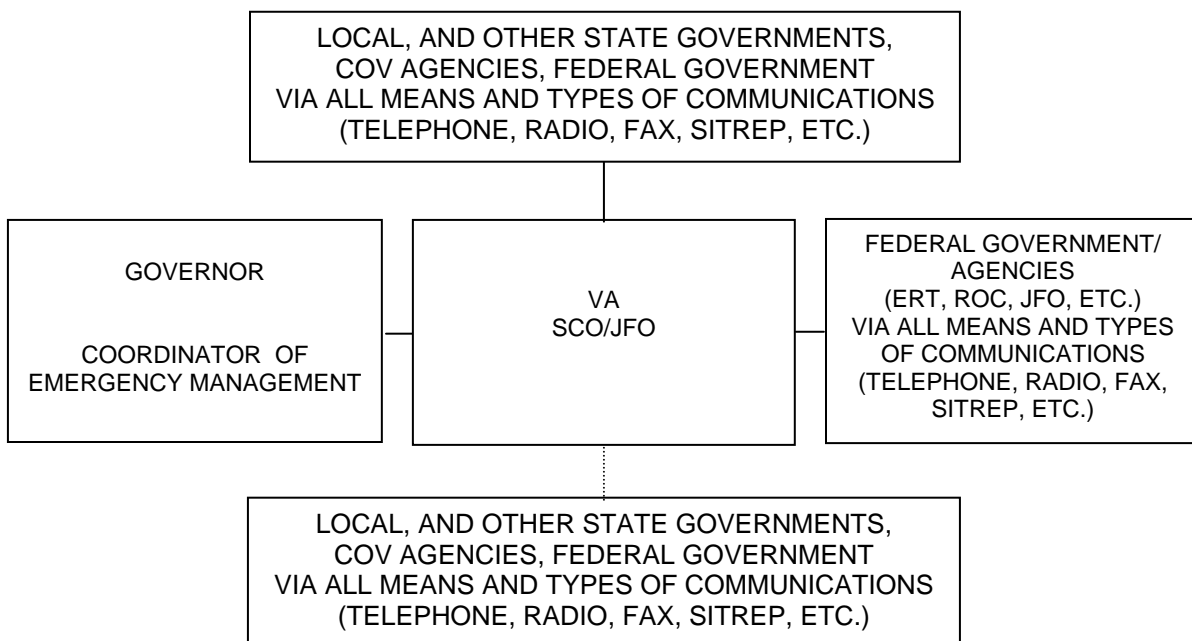
- A. **72 Hours (3 Days):** Begin conference calls at least twice per day.
- B. **36 to 28 Hours:** Advise at-risk jurisdictions and key state agencies of the prepositioning of state resources and discuss the implementation of Phase One evacuation at 27 hours and the potential lane reversal decision at 20 hours.
- C. **23 Hours:** Advise at-risk jurisdictions and key state agencies to implement **mandatory lane reversal at 20 hours** and have localities identify “refuges of last resort”. Also, discuss the necessity of Phase Two evacuation at 14 hours, if required.
- D. **17 to 16 Hours:** Advise at-risk jurisdictions and key state agencies of the decision to implement Phase Two evacuation, if required.
- E. **6 Hours:** Advise localities and key state agencies to coordinate the preparation to stop **mandatory lane reversal** and initiate road clearance at 3 hours before the arrival of tropical storm force winds.

Reporting Flow Diagram

PHASE: PRIOR TO AND DURING EMERGENCY OPERATIONS



PHASE: AFTER INITIAL EMERGENCY AND ESTABLISHMENT OF COMPLETE ERT AND JFO



Annex A, Attachment 2
HURREVAC AND DECISION ARCS

STORM ASSESSMENT

A. Purpose

The purpose of this section is to provide a guide to storm assessment as an aid to the decision-maker. It must be understood that HURREVAC 2000 and decision arcs are only an aid to decision making. The decision as to whether or not to evacuate vulnerable populations can only be made by the appropriate authority, and must be based upon a wide range of relevant information. Decision arcs can provide cues as to when decisions should be made, but not the decisions themselves. This data will be updated with new data upon completion of the on going Virginia Hurricane Evacuation Restudy.

B. Background

1. Along the Atlantic seaboard, hurricanes do not ordinarily approach the coast from a direction perpendicular to the coastline. Instead, the more typical case is that they are curving up from the tropics, and are being affected by all sorts of esoteric weather and geographic phenomena ranging from upper air currents to the Gulf Stream. This means that, try as we might, we cannot always accurately predict the angle of approach to the shore. Since at a typical angle of approach (nearly parallel) an error of 10 degrees in predicting the hurricane track can easily mean a 100 mile error in predicted landfall the next day, this uncertainty must be borne in mind at all times when doing emergency planning. The average error of a 12 hour official track forecast is 47 nautical miles, and the further ahead the forecast, the worse the prediction.
2. In addition to the location error of the official forecast track, the uncertainties that go with a storm approaching nearly parallel to the coast create errors in time of predicting landfall. Hurricanes also speed up, slow down, stop and start, and occasionally do loops en route to landfall, thus further complicating emergency planning and decision-making.
3. Decision Arcs represent a “Handraulic” means of graphically minimizing uncertainty and presenting the decision-maker with reasonably accurate timeframes for decision-making. There are several commercially produced computer software programs available, which automate and enhance the Decision Arc system. The “HURREVAC 2000” computer software system is one of those programs. The decision-maker must always bear in mind, however, that "Hurricanes do what they want to do" and that they always bear close watching.

HURREVAC 2000

BACKGROUND

- A. Each “At-Risk” jurisdiction has been provided access to the storm tracking and evacuation timing computer program “HURREVAC 2000”. HURREVAC, a hurricane evacuation decision assistance program for emergency managers, is a U. S. Government program produced by DHS/FEMA and the Corps of Engineers for the emergency management community, and is not for public distribution. This program is a tool, which automates the decision arc process and which incorporates the evacuation timing data from the 1992 TDR and also includes the NHC Wind Decay Model to project the timing and impact of winds on coastal and inland counties.
- B. HURREVAC is a common decision aid for the entire Commonwealth of Virginia. It permits emergency managers to coordinate state, regional and local hurricane response actions based upon a single set of official facts, studies, models and predictions. Accordingly the HURREVAC forecast and data will be used as the basis for discussions and conference calls coordinating hurricane protective decisions and actions. As such, HURREVAC and its associated data have been designated as the single source for official hurricane data and forecast and will be used as the basis for hurricane related decisions in the Commonwealth of Virginia. It is emphasized that HURREVAC does not make decisions. It does provide a common point of reference for decision-making. Appropriate state and local officials make all decisions.

HURREVAC METHODOLOGY

State and local emergency managers will use HURREVAC to obtain the latest official hurricane advisory and easily interpreted storm history, forecast track, characteristics, and current position. Current advisory data is downloaded directly from the Internet or can be manually entered into the program. Recognizing that precise prediction of future actions is not possible, HURREVAC combines the historic NHC forecast errors to provide an indication of affected areas should the hurricane deviate from its predicted track. Armed with this information, the emergency manager is able to make timely evacuation, sheltering and other community protective decision actions.

VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT (VDEM)

- A. VDEM will track active named tropical systems using HURREVAC.

- B. Upon determination that Virginia localities may be affected, conference calls will be initiated as required to ensure that potential affected areas are alert and taking appropriate actions.
- C. Issue news releases and other public information as appropriate.
- D. Monitor the status of local actions and provide assistance, resources, guidance or coordination as may be appropriate.

NATIONAL WEATHER SERVICE - NATIONAL HURRICANE CENTER

- A. Serves as the single source of facts, predictions and forecast for all hurricanes. Information from the NHC and the Wakefield WFO will form the basis for all Virginia Hurricane decisions.
- B. Provide hurricane data for use with HURREVAC. This data will be available to emergency managers via the Internet.

LOCALITIES

- A. Track all hurricanes.
- B. Use HURREVAC to monitor the position and forecast path of all hurricanes.
- C. Upon determination that the local jurisdiction may be within the path of the hurricane or the effects of the hurricane, initiate actions to inform and prepare the public to take early protective actions.
- D. As the storm approaches and the certainty that the hurricane will impact or affect the area increases, implement evacuation, sheltering and other decisions.
- E. Coordinate public information releases and other decisions with neighboring jurisdictions.
- F. Activate the EOC in a timely manner.
- G. Ensure that VDEM is informed of the local situation.
- H. Jurisdictions not adversely threatened, should be alert to provide shelter and assistance to evacuees from other localities.

DECISION ARCS

This section also contains a training package, which is intended to provide a "Stand Alone" Decision Arc capability for local and regional emergency services personnel. The objective is to allow emergency service personnel, by the completion of this package, to be familiar with the process of decision arc plotting, and the fundamental considerations necessary for sound decisions in the face of a hurricane. In order to employ the decision arc method, you will need two separate but related items, which, when used together, present a graphic depiction of the hurricane's present and predicted situation as it relates to each city and county. These are the decision arc map and the Special Tool for Omni-directional Radial Measurements, whose acronym is appropriately, "STORM".

A. Decision Arc Map

In order to properly evaluate the last reported position and forecast track of an approaching storm, special hurricane tracking charts have been developed for three separate geographic areas in eastern Virginia. Superimposed on an ordinary tracking chart is a series of concentric arcs centered on each of the areas and spaced at 20 nautical mile intervals. There are maps for the Tidewater Zone, the Eastern Shore Zone and the Upper Neck Zone. These maps are included as an attachment to this package.

B. STORM

1. The STORM is used as a two dimensional depiction of an approaching hurricane. It is a transparent disk with concentric circles at 20- nautical mile intervals centered on the hurricane's eye. These circles form a scale used to note the radii of gale force (34 knot) winds as reported by the National Hurricane Center in the marine advisory.
2. It should be noted that any size map and STORM could be constructed to fit the needs of a particular locality. The map and the STORM must always be of the same scale however.

DECISION ARC METHODOLOGY

A. Decision Arc Instructions

1. Assemble basic "tools" for use. These are:
 - a. Decision Arc map appropriate for your zone.

- b. Local Decision Arc table(s).
 - c. Transparent STORM disc, Figure 1.
 - d. Latest National Weather Service forecast advisory.
2. Using the NWS forecast advisory, plot the last reported position of the hurricane eye on the Decision Arc map. Note the position with date and ZULU time. You may wish to convert ZULU to local time for convenience. Plot and annotate the forecast positions of the hurricane similarly.
3. Note the largest radius of tropical storm force (34 knot) winds, the forecast maximum sustained wind speed at landfall (this determines hurricane category), and the current forward speed of the hurricane.
4. Using the maximum forecast sustained wind speed at landfall, enter the Saffir/Simpson hurricane scale table, and determine the category of the approaching hurricane. Because of uncertainties inherent in forecasting, the Virginia Department of Emergency Management and the National Hurricane Center recommend that you add one category to the forecast landfall intensity for planning purposes. With the amended category and the forward speed of the hurricane, enter the local Decision Arc table and derive the appropriate clearance time. This time gives you the correct Decision Arc; mark this arc on your local Decision Arc map.
5. Plot the largest radius of 34-knot (tropical storm force) winds on your STORM disk.
6. Put the STORM disk on the Decision Arc map with the center of the STORM disk at the last reported location of the hurricane eye. If the 34-knot wind line touches or crosses the Decision Arc line, you should have already made your evacuation decision and be implementing it.
7. Determine what the forecast forward speed of the hurricane is by measuring the distance between the first and second forecast positions and divide by 12. If this derived speed is greater than the present speed, the hurricane is expected to accelerate and you should repeat the above steps to re-determine an appropriate Decision Arc.
8. Move the STORM disk to the first forecast position and see if the 34-knot wind line crosses or touches the Decision Arc line. If it does, then you must make your decision before the next forecast. Arithmetic will let you derive your decision time.
9. Use the wind probabilities table in the NHC advisory to determine where evacuation is likely to take place. Determine how other jurisdictions will be affected by an

evacuation of yours and when and how they should be notified. Check inundation maps to determine where flooding may occur and evacuation zone maps for zones that should evacuate.

10. When you reach the decision point, check the NWS wind probability table for your location. If the probability is increasing, you should strongly consider recommending evacuation.
 11. Repeat steps 1 through 10 after receiving each NWS advisory until you make a decision or the storm has passed.
- B. It should be noted that there is no built-in provision in the Decision Arc process for time for decision-making, mobilizing support personnel, etc. These activities should be completed prior to reaching the decision point. As each bit of new information becomes available in forecast advisories, the evacuation decision and preparation process should progress so that, if necessary, the evacuation recommendation can be given by the decision point.
- C. Remember that information given in the advisories are using nautical miles and knots (1 knot = 1 nautical mile per hour). If you use information, maps, etc. from other sources, those data must be converted to nautical from statute units.

DECISION ARCS
 Accomack County
 (Use Eastern Shore Decision Arc Map)

Storm Category/Forward Speed (in Knots)	Evacuee Response	Clearance Time in Hours/Clearance Time Arc	
		Seasonal Occupancy Low	High
CAT 1-2/10	Rapid	6-1/2 D	9-1/4 E
CAT 1-2/10	Medium	7-1/2 D	10 E
CAT 1-2/10	Slow	9-1/2 E	11 F
CAT 1-2/20	Rapid	6-1/2 G	9-1/4 J
CAT 1-2/20	Medium	7-1/2 H	10 J
CAT 1-2/20	Slow	9-1/2 J	11 K
CAT 1-2/30	Rapid	6-1/2 J	9-1/4 N
CAT 1-2/30	Medium	7-1/2 L	10 T
CAT 1-2/30	Slow	9-1/2 O	11 V
CAT 1-2/40	Rapid	6-1/2 M	9-1/4 S
CAT 1-2/40	Medium	7-1/2 O	10 T
CAT 1-2/40	Slow	9-1/2 S	11 V
CAT 3-4/10	Rapid	7-1/2 D	10 E
CAT 3-4/10	Medium	8-1/4 E	10-1/2 F
CAT 3-4/10	Slow	9-1/2 E	11-1/2 F
CAT 3-4/20	Rapid	7-1/2 H	10 J
CAT 3-4/20	Medium	8-1/4 I	10-1/2 K
CAT 3-4/20	Slow	9-1/2 J	11-1/2 L
CAT 3-4/30	Rapid	7-1/2 L	10 O
CAT 3-4/30	Medium	8-1/4 M	10-1/2 P
CAT 3-4/30	Slow	9-1/2 O	11-1/2 R
CAT 3-4/40	Rapid	7-1/2 O	10 T
CAT 3-4/40	Medium	8-1/4 Q	10-1/2 U
CAT 3-4/40	Slow	9-1/2 S	11-1/2 W

DECISION ARCS
 Chesapeake
 (Use Tidewater Area Decision Arc Map)

Storm Category/Forward Speed (in Knots)	Evacuee Response	<u>Clearance Time in Hours/Clearance Time Arc</u>	
		Coastal Seasonal Occupancy Low	High
CAT 1/10	Rapid	3 B	4 B
CAT 1/10	Medium	6 C	6 C
CAT 1/10	Slow	9 E	9 E
CAT 1/20	Rapid	3 C	4 D
CAT 1/20	Medium	6 F	6 F
CAT 1/20	Slow	9 I	9 I
CAT 1/30	Rapid	3 E	4 F
CAT 1/30	Medium	6 I	6 I
CAT 1/30	Slow	9 N	9 N
CAT 1/40	Rapid	3 F	4 H
CAT 1/40	Medium	6 L	6 L
CAT 1/40	Slow	9 R	9 R
CAT 2-3/10	Rapid	5-1/4 C	6-1/4 D
CAT 2-3/10	Medium	6 C	7 D
CAT 2-3/10	Slow	9 E	9 E
CAT 2-3/20	Rapid	5-1/4 F	6-1/4 G
CAT 2-3/20	Medium	6 F	7 G
CAT 2-3/20	Slow	9 I	9 I
CAT 2-3/30	Rapid	5-1/4 H	6-1/4 J
CAT 2-3/30	Medium	6 J	7 K
CAT 2-3/30	Slow	9 N	9 N
CAT 2-3/40	Rapid	5-1/4 K	6-1/4 M
CAT 2-3/40	Medium	6 L	7 N
CAT 2-3/40	Slow	9 R	9 R
CAT 4/10	Rapid	8-1/2 E	9-3/4 E
CAT 4/10	Medium	9-1/4 E	10-1/4 F
CAT 4/10	Slow	10-1/4 F	11-1/4 F
CAT 4/20	Rapid	8-1/2 I	9-3/4 J
CAT 4/20	Medium	9-1/4 J	10-1/4 K
CAT 4/20	Slow	10-1/4 K	11-1/4 L
CAT 4/30	Rapid	8-1/2 M	9-3/4 O
CAT 4/30	Medium	9-1/4 N	10-1/4 P
CAT 4/30	Slow	10-1/4 P	11-1/4 Q
CAT 4/40	Rapid	8-1/2 Q	9-3/4 T
CAT 4/40	Medium	9-1/4 S	10-1/4 U
CAT 4/40	Slow	10-1/4 U	11-1/4 W

DECISION ARCS
 Gloucester County
 (Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-2/10	Immediate	3-1/2 B
CAT 1-2/10	Rapid	4-1/4 C
CAT 1-2/10	Medium	6-1/4 D
CAT 1-2/10	Slow	9-1/4 E
CAT 1-2/20	Immediate	3-1/2 D
CAT 1-2/20	Rapid	4-1/4 E
CAT 1-2/20	Medium	6-1/4 G
CAT 1-2/20	Slow	9-1/4 J
CAT 1-2/30	Immediate	3-1/2 F
CAT 1-2/30	Rapid	4-1/4 G
CAT 1-2/30	Medium	6-1/4 J
CAT 1-2/30	Slow	9-1/4 N
CAT 1-2/40	Immediate	3-1/2 G
CAT 1-2/40	Rapid	4-1/4 I
CAT 1-2/40	Medium	6-1/4 M
CAT 1-2/40	Slow	9-1/4 S
CAT 3-4/10	Immediate	7-1/4 D
CAT 3-4/10	Rapid	8-1/2 E
CAT 3-4/10	Medium	10-1/2 F
CAT 3-4/10	Slow	13-1/2 G
CAT 3-4/20	Immediate	7-1/4 H
CAT 3-4/20	Rapid	8-1/2 I
CAT 3-4/20	Medium	10-1/2 K
CAT 3-4/20	Slow	13-1/2 N
CAT 3-4/30	Immediate	7-1/4 K
CAT 3-4/30	Rapid	8-1/2 M
CAT 3-4/30	Medium	10-1/2 P
CAT 3-4/30	Slow	13-1/2 U
CAT 3-4/40	Immediate	7-1/4 O
CAT 3-4/40	Rapid	8-1/2 Q
CAT 3-4/40	Medium	10-1/2 U
CAT 3-4/40	Slow	13-1/2 AA

DECISION ARC
Hampton
(Use Tidewater Area Decision Arc Map)

Storm Category/ Forward Speed (in Knots)	Evacuee Response	Clearance Time in Hours/Clearance Time Arc		
		Coastal Seasonal Occ.	(Local Movements	Not on I-64)
		Low	High	
CAT 1-2/10	Rapid	9-3/4 E	11-1/2 F	3 B
CAT 1-2/10	Medium	11 F	12-1/2 G	6 C
CAT 1-2/10	Slow	12-3/4 G	14-1/2 H	9 E
CAT 1-2/20	Rapid	9-3/4 J	11-1/2 L	3 C
CAT 1-2/20	Medium	11K	12-1/2 M	6 F
CAT 1-2/20	Slow	12-3/4 N	14-1/2 O	9 I
CAT 1-2/30	Rapid	9-3/4 T	11-1/2 R	3 E
CAT 1-2/30	Medium	11 Q	12-1/2 S	6 I
CAT 1-2/30	Slow	12-3/4 T	14-1/2 V	9 N
CAT 1-2/40	Rapid	9-3/4 T	11-1/2 W	3 F
CAT 1-2/40	Medium	11 V	12-1/2 Y	6 L
CAT 1-2/40	Slow	12-3/4 Z	14-1/2 CC	9 R
CAT 3/10	Rapid	15-1/2 H	17 I	3 B
CAT 3/10	Medium	16-1/2 I	18-1/4 J	6 C
CAT 3/10	Slow	18-1/4 J	20 J	9 E
CAT 3/20	Rapid	15-1/2 P	17 Q	3 C
CAT 3/20	Medium	16-1/2 Q	18-1/4 S	6 F
CAT 3/20	Slow	18-1/4 S	20 T	9 I
CAT 3/30	Rapid	15-1/2 X	17 Z	3 E
CAT 3/30	Medium	16-1/2 Y	18-1/4 BB	6 I
CAT 3/30	Slow	18-1/4 BB	20 DD	9 N
CAT 3/40	Rapid	15-1/2 EE	17 HH	3 F
CAT 3/40	Medium	16-1/2 GG	18-1/4 KK	6 L
CAT 3/40	Slow	18-1/4 KK	20 NN	9 R
CAT 4/10	Rapid	19 J	21 K	3 B
CAT 4/10	Medium	20-1/4 K	22-1/4 L	6 C
CAT 4/10	Slow	22 K	24 L	9 E
CAT 4/20	Rapid	19 S	21 U	3 C
CAT 4/20	Medium	20-1/4 U	22-1/4 W	6 F
CAT 4/20	Slow	22 V	24 X	9 I
CAT 4/30	Rapid	19 CC	21 FF	3 E
CAT 4/30	Medium	20-1/4 EE	22-1/4 HH	6 I
CAT 4/30	Slow	22 GG	24 JJ	9 N
CAT 4/40	Rapid	19 LL	21 PP	3 F
CAT 4/40	Medium	20-1/4 OO	22-1/4 SS	6 L
CAT 4/40	Slow	22 RR	24 WW	9 R

DECISION ARCS

Lancaster County
(Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-4/10	Immediate	1 A
CAT 1-4/10	Rapid	3-1/4 B
CAT 1-4/10	Medium	6-1/4 D
CAT 1-4/10	Slow	9-1/4 E
CAT 1-4/20	Immediate	1 A
CAT 1-4/20	Rapid	3-1/4 D
CAT 1-4/20	Medium	6-1/4 G
CAT 1-4/20	Slow	9-1/4 J
CAT 1-4/30	Immediate	1 B
CAT 1-4/30	Rapid	3-1/4 E
CAT 1-4/30	Medium	6-1/4 J
CAT 1-4/30	Slow	9-1/4 N
CAT 1-4/40	Immediate	1 B
CAT 1-4/40	Rapid	3-1/4 G
CAT 1-4/40	Medium	6-1/4 M
CAT 1-4/40	Slow	9-1/4 S

DECISION ARCS
 Mathews County
 (Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-2/10	Immediate	1-1/2 A
CAT 1-2/10	Rapid	3-1/4 B
CAT 1-2/10	Medium	6-1/4 D
CAT 1-2/10	Slow	9-1/4 E
CAT 1-2/20	Immediate	1-1/2 B
CAT 1-2/20	Rapid	3-1/4 D
CAT 1-2/20	Medium	6-1/4 G
CAT 1-2/20	Slow	9-1/4 J
CAT 1-2/30	Immediate	1-1/2 C
CAT 1-2/30	Rapid	3-1/4 E
CAT 1-2/30	Medium	6-1/4 J
CAT 1-2/30	Slow	9-1/4 N
CAT 1-2/40	Immediate	1-1/2 C
CAT 1-2/40	Rapid	3-1/4 G
CAT 1-2/40	Medium	6-1/4 M
CAT 1-2/40	Slow	9-1/4 S
CAT 3-4/10	Immediate	1-3/4 A
CAT 3-4/10	Rapid	3-1/4 B
CAT 3-4/10	Medium	6-1/4 D
CAT 3-4/10	Slow	9-1/4 E
CAT 3-4/20	Immediate	1-3/4 B
CAT 3-4/20	Rapid	3-1/4 D
CAT 3-4/20	Medium	6-1/4 G
CAT 3-4/20	Slow	9-1/4 J
CAT 3-4/30	Immediate	1-3/4 C
CAT 3-4/30	Rapid	3-1/4 E
CAT 3-4/30	Medium	6-1/4 J
CAT 3-4/30	Slow	9-1/4 N
CAT 3-4/40	Immediate	1-3/4 D
CAT 3-4/40	Rapid	3-1/4 G
CAT 3-4/40	Medium	6-1/4 M
CAT 3-4/40	Slow	9-1/4 S

DECISION ARCS
Middlesex County
(Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-4/10	Immediate	2 A
CAT 1-4/10	Rapid	3-1/4 B
CAT 1-4/10	Medium	6-1/4 D
CAT 1-4/10	Slow	9-1/4 E
CAT 1-4/20	Immediate	2 B
CAT 1-4/20	Rapid	3-1/4 D
CAT 1-4/20	Medium	6-1/4 G
CAT 1-4/20	Slow	9-1/4 J
CAT 1-4/30	Immediate	2 C
CAT 1-4/30	Rapid	3-1/4 E
CAT 1-4/30	Medium	6-1/4 J
CAT 1-4/30	Slow	9-1/4 N
CAT 1-4/40	Immediate	2 D
CAT 1-4/40	Rapid	3-1/4 G
CAT 1-4/40	Medium	6-1/4 M
CAT 1-4/40	Slow	9-1/4 S

DECISION ARC
Newport News
(Use Tidewater Area Decision Arc Map)

Storm Category/ Forward Speed (in Knots)	Evacuee Response	Clearance Time in Hours/Clearance Time Arc		
		Coastal Seasonal Occ. Low	High	(Local Movements Not on I-64)
CAT 1-2/10	Rapid	9-3/4 E	11-1/2 F	3 B
CAT 1-2/10	Medium	10-1/2 F	12-1/4 G	6 C
CAT 1-2/10	Slow	11-3/4 G	13-1/2 G	9 E
CAT 1-2/20	Rapid	9-3/4 J	11-1/2 L	3 C
CAT 1-2/20	Medium	10-1/2 K	12-1/4 M	6 F
CAT 1-2/20	Slow	11-3/4 L	13-1/2 N	9 I
CAT 1-2/30	Rapid	9-3/4 O	11-1/2 R	3 E
CAT 1-2/30	Medium	10-1/2 P	12-1/4 S	6 I
CAT 1-2/30	Slow	11-3/4 R	13-1/2 U	9 N
CAT 1-2/40	Rapid	9-3/4 T	11-1/2 W	3 F
CAT 1-2/40	Medium	10-1/2 U	12-1/4 Y	6 L
CAT 1-2/40	Slow	11-3/4 X	13-1/2 AA	9 R
CAT 3-4/10	Rapid	19-1/2 J	21-1/2 K	3 B
CAT 3-4/10	Medium	20-1/4 K	22-1/4 L	6 C
CAT 3-4/10	Slow	21-1/2 K	23-1/2 L	9 E
CAT 3-4/20	Rapid	19-1/2 T	21-1/2 V	3 C
CAT 3-4/20	Medium	20-1/4 U	22-1/4 W	6 F
CAT 3-4/20	Slow	21-1/2 V	23-1/2 X	9 I
CAT 3-4/30	Rapid	19-1/2 DD	21-1/2 GG	3 E
CAT 3-4/30	Medium	20-1/4 EE	22-1/4 HH	6 I
CAT 3-4/30	Slow	21-1/2 GG	12-1/2 JJ	9 N
CAT 3-4/40	Rapid	19-1/2 MM	21-1/2 QQ	3 F
CAT 3-4/40	Medium	20-1/2 OO	22-1/4 SS	6 L
CAT 3-4/40	Slow	21-1/2 QQ	23-1/2 UU	9 R

DECISION ARC
Norfolk
(Use Tidewater Area Decision Arc Map)

Storm Category/Forward Speed (in Knots)	Evacuee Response	<u>Clearance Time in Hours/Clearance Time Arc</u>	
		Seasonal Occupancy	
		Low	High
CAT 1-2/10	Rapid	7-3/4 D*	9-3/4 E*
CAT 1-2/10	Medium	9-1/4 E*	11 F*
CAT 1-2/10	Slow	11-1/4 F*	13-1/4 G*
CAT 1-2/20	Rapid	7-3/4 H*	9-3/4 J*
CAT 1-2/20	Medium	9-1/4 J*	11 K*
CAT 1-2/20	Slow	11-1/4 L*	13-1/4 N*
CAT 1-2/30	Rapid	7-3/4 L*	9-3/4 O*
CAT 1-2/30	Medium	9-1/4 N*	11 Q*
CAT 1-2/30	Slow	11-1/4 Q*	13-1/4 T*
CAT 1-2/40	Rapid	7-3/4 P*	9-3/4 T*
CAT 1-2/40	Medium	9-1/4 S*	11 V*
CAT 1-2/40	Slow	11-1/4 W*	13-1/4 AA*
CAT 3/10	Rapid	13-3/4 G*	15-3/4 H*
CAT 3/10	Medium	15 H*	17 I*
CAT 3/10	Slow	17 I*	19-1/4 J*
CAT 3/20	Rapid	13-3/4 N*	15-3/4 P*
CAT 3/20	Medium	15 O*	17 Q*
CAT 3/20	Slow	17 Q*	19-1/4 T*
CAT 3/30	Rapid	13-3/4 U*	15-3/4 X*
CAT 3/30	Medium	15 W*	17 Z*
CAT 3/30	Slow	17 Z*	19-1/4 CC*
CAT 3/40	Rapid	13-3/4 BB*	15-3/4 FF*
CAT 3/40	Medium	15 DD*	17 HH*
CAT 3/40	Slow	17 HH*	19-1/4 MM*
CAT 4/10	Rapid	16-1/4 I**	18-1/1 J*
CAT 4/10	Medium	17-1/2 I**	20 J*
CAT 4/10	Slow	19-3/4 J**	22 K*
CAT 4/20	Rapid	16-1/4 Q*	18-1/2 S*
CAT 4/20	Medium	17-1/2 R*	20 T*
CAT 4/20	Slow	19-3/4 T*	22 V*
CAT 4/30	Rapid	16-1/4 Y*	18-1/2 BB*
CAT 4/30	Medium	17-1/2 AA*	20 DD*
CAT 4/30	Slow	19-3/4 DD*	22 GG*
CAT 4/40	Rapid	16-1/4 GG*	18-1/2 KK*
CAT 4/40	Medium	17-1/2 II*	20 NN*
CAT 4/40	Slow	19-3/4 NN*	22 RR*

* Local decision-makers should examine decision arcs for Hampton for this scenario.

DECISION ARCS
 Northampton County
 (Use Eastern Shore Decision Arc Map)

Storm Category/Forward Speed (in Knots)	Evacuee Response	Clearance Time in Hours/Clearance Time Arc	
		Seasonal Occupancy Low	High
CAT 1-2/10	Rapid	6-1/2 D	9 E
CAT 1-2/10	Medium	7-1/4 D	9-1/2 E
CAT 1-2/10	Slow	9-3/4 E	10-3/4 F
CAT 1-2/20	Rapid	6-1/2 G	9 I
CAT 1-2/20	Medium	7-1/4 H	9-1/2 J
CAT 1-2/20	Slow	9-3/4 J	10-3/4 K
CAT 1-2/30	Rapid	6-1/2 J	9 N
CAT 1-2/30	Medium	7-1/4 K	9-1/2 O
CAT 1-2/30	Slow	9-3/4 O	10-3/4 Q
CAT 1-2/40	Rapid	6-1/2 M	9 R
CAT 1-2/40	Medium	7-1/4 O	9-1/2 S
CAT 1-2/40	Slow	9-3/4 T	10-3/4 V
CAT 3-4/10	Rapid	7-1/4 D	9-3/4 E
CAT 3-4/10	Medium	8 D	10-1/4 E
CAT 3-4/10	Slow	9-3/4 E	11-1/4 F
CAT 3-4/20	Rapid	7-1/4 H	9-3/4 J
CAT 3-4/20	Medium	8 H	10-1/4 K
CAT 3-4/20	Slow	9-3/4 J	11-1/4 L
CAT 3-4/30	Rapid	7-1/4 K	9-3/4 O
CAT 3-4/30	Medium	8 L	10-1/4 P
CAT 3-4/30	Slow	9-3/4 O	11-1/4 Q
CAT 3-4/40	Rapid	7-1/4 O	9-3/4 T
CAT 3-4/40	Medium	8 P	10-1/4 U
CAT 3-4/40	Slow	9-3/4 T	11-1/4 W

DECISION ARCS
Northumberland County
(Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-4/10	Immediate	1 S
CAT 1-4/10	Rapid	3-1/4 B
CAT 1-4/10	Medium	6-1/4 D
CAT 1-4/10	Slow	9-1/4 E
CAT 1-4/20	Immediate	1 A
CAT 1-4/20	Rapid	3-1/4 D
CAT 1-4/20	Medium	6-1/4 G
CAT 1-4/20	Slow	9-1/4 J
CAT 1-4/30	Immediate	1 B
CAT 1-4/30	Rapid	3-1/4 E
CAT 1-4/30	Medium	6-1/4 J
CAT 1-4/30	Slow	9-1/4 N
CAT 1-4/40	Immediate	1 B
CAT 1-4/40	Rapid	3-1/4 G
CAT 1-4/40	Medium	6-1/4 M
CAT 1-4/40	Slow	9-1/4 S

DECISION ARCS
 Poquoson
 (Use Tidewater Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours*/ Clearance Time Arc</u>
CAT 1/10	Rapid	3 B
CAT 1/10	Medium	6 C
CAT 1/10	Slow	9 E
CAT 1/20	Rapid	3 C
CAT 1/20	Medium	6 F
CAT 1/20	Slow	9 I
CAT 1/30	Rapid	3 E
CAT 1/30	Medium	6 I
CAT 1/30	Slow	9 N
CAT 1/40	Rapid	3 F
CAT 1/40	Medium	6 L
CAT 1/40	Slow	9 R
CAT 2-4/10	Rapid	4-1/2 C
CAT 2-4/10	Medium	6 C
CAT 2-4/10	Slow	9 E
CAT 2-4/20	Rapid	4-1/2 E
CAT 2-4/20	Medium	6 F
CAT 2-4/20	Slow	9 I
CAT 2-4/30	Rapid	4-1/2 G
CAT 2-4/30	Medium	6 I
CAT 2-4/30	Slow	9 N
CAT 2-4/40	Rapid	4-1/2 I
CAT 2-4/40	Medium	6 L
CAT 2-4/40	Slow	9 R

* Local decision-makers should be aware of Hampton decision arcs for Hampton for all scenarios.

DECISION ARCS
 Portsmouth
 (Use Tidewater Area Decision Arc Map)

Storm Category/Forward Speed (in Knots)	Evacuee Response	<u>Clearance Time in Hours/Clearance Time Arc</u>	
		Coastal Seasonal Occupancy Low	High
CAT 1/10	Rapid	3-1/4 B	3-1/4 B
CAT 1/10	Medium	6-1/4 D	6-1/4 D
CAT 1/10	Slow	9-1/4 E	9-1/4 E
CAT 1/20	Rapid	3-1/4 D	3-1/4 D
CAT 1/20	Medium	6-1/4 G	6-1/4 G
CAT 1/20	Slow	9-1/4 J	9-1/4 J
CAT 1/30	Rapid	3-1/4 E	3-1/4 E
CAT 1/30	Medium	6-1/4 J	6-1/4 J
CAT 1/30	Slow	9-1/4 N	9-1/4 N
CAT 1/40	Rapid	3-1/4 H	3-1/4 H
CAT 1/40	Medium	6-1/4 M	6-1/4 M
CAT 1/40	Slow	9-1/4 S	9-1/4 S
CAT 2-3/10	Rapid	3-1/4 B	3-1/2 B
CAT 2-3/10	Medium	6-1/4 D	6-1/4 D
CAT 2-3/10	Slow	9-1/4 E	9-1/4 E
CAT 2-3/20	Rapid	3-1/4 D	3-1/2 D
CAT 2-3/20	Medium	6-1/4 G	6-1/4 G
CAT 2-3/20	Slow	9-1/4 J	9-1/4 J
CAT 2-3/30	Rapid	3-1/4 E	3-1/2 F
CAT 2-3/30	Medium	6-1/4 J	6-1/4 J
CAT 2-3/30	Slow	9-1/4 N	9-1/4 N
CAT 2-3/40	Rapid	3-1/4 H	3-1/2 H
CAT 2-3/40	Medium	6-1/4 M	6-1/4 M
CAT 2-3/40	Slow	9-1/4 S	9-1/4 S
CAT 4/10	Rapid	5 C	5-1/2 C
CAT 4/10	Medium	6-1/4 D	6-1/2 D
CAT 4/10	Slow	9-1/4 E	9-1/4 E
CAT 4/20	Rapid	5 E	5-1/2 F
CAT 4/20	Medium	6-1/4 G	6-1/2 G
CAT 4/20	Slow	9-1/4 J	9-1/4 J
CAT 4/30	Rapid	5 H	5-1/2 I
CAT 4/30	Medium	6-1/4 J	6-1/2 J
CAT 4/30	Slow	9-1/4 N	9-1/4 N
CAT 4/40	Rapid	5 J	5-1/2 K
CAT 4/40	Medium	6-1/4 M	6-1/2 M
CAT 4/40	Slow	9-1/4 S	9-1/4 S

DECISION ARCS
Richmond County
(Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-4/10	Immediate	1 A
CAT 1-4/10	Rapid	3-1/4 B
CAT 1-4/10	Medium	6-1/4 D
CAT 1-4/10	Slow	9-1/4 E
CAT 1-4/20	Immediate	1 A
CAT 1-4/20	Rapid	3-1/4 D
CAT 1-4/20	Medium	6-1/4 G
CAT 1-4/20	Slow	9-1/4 J
CAT 1-4/30	Immediate	1 B
CAT 1-4/30	Rapid	3-1/4 E
CAT 1-4/30	Medium	6-1/4 J
CAT 1-4/30	Slow	9-1/4 N
CAT 1-4/40	Immediate	1 B
CAT 1-4/40	Rapid	3-1/4 G
CAT 1-4/40	Medium	6-1/4 M
CAT 1-4/40	Slow	9-1/4 S

DECISION ARCS
 Suffolk
 (Use Tidewater Area Decision Arc Map)

Storm Category/ Forward Speed (in Knots)	Evacuee Response	<u>Clearance Time in Hours/Clearance Time Arc</u>		
		Coastal Seasonal Occ. <u>Low</u>	<u>High</u>	Local Movements <u>Only</u>
CAT 1/10	Rapid	4 B	7-1/2 D	3 B
CAT 1/10	Medium	6 C	8-1/2 E	6 C
CAT 1/10	Slow	9 E	9-3/4 E	9 E
CAT 1/20	Rapid	4 D	9-1/2 H	3 C
CAT 1/20	Medium	6 F	8-1/4 I	6 F
CAT 1/20	Slow	9 I	9-3/4 J	9 I
CAT 1/30	Rapid	4 F	7-1/2 L	3 E
CAT 1/30	Medium	6 I	8-1/4 M	6 I
CAT 1/30	Slow	9 N	9-3/4 O	9 N
CAT 1/40	Rapid	4 H	7-1/2 O	3 F
CAT 1/40	Medium	6 L	8-1/4 Q	6 L
CAT 1/40	Slow	9 R	9-3/4 T	9 R
CAT 2-3/10	Rapid	5-1/2 C	10-1/2 F	3 B
CAT 2-3/10	Medium	7 D	11-1/4 F	6 C
CAT 2-3/10	Slow	9-1/4 E	12-1/2 G	9 E
CAT 2-3/20	Rapid	5-1/2 F	10-1/2 K	3 C
CAT 2-3/20	Medium	7 H	11-1/4 L	6 F
CAT 2-3/20	Slow	9-1/4 J	12-1/2 M	9 I
CAT 2-3/30	Rapid	5-1/2 I	10-1/2 P	3 E
CAT 2-3/30	Medium	7 K	11-1/4 Q	6 I
CAT 2-3/30	Slow	9-1/4 N	12-1/2 S	9 N
CAT 2-3/40	Rapid	5-1/2 K	10-1/2 U	3 F
CAT 2-3/40	Medium	7 N	11-1/4 W	6 L
CAT 2-3/40	Slow	9-1/4 S	12-1/2 Y	9 R
CAT 4/10	Rapid	7-1/4 D	13-1/2 G	3 B
CAT 4/10	Medium	8-1/4 E	14-1/2 H	6 C
CAT 4/10	Slow	9-1/2 E	15-1/2 H	9 E
CAT 4/20	Rapid	7-1/4 H	13-1/2 N	3 C
CAT 4/20	Medium	8-1/4 H	14-1/2 O	6 F
CAT 4/20	Slow	9-1/2 J	15-1/2 P	9 I
CAT 4/30	Rapid	7-1/4 L	13-1/2 U	3 E
CAT 4/30	Medium	8-1/2 M	14-1/4 V	6 I
CAT 4/30	Slow	9-1/2 O	15-1/2 X	9 N
CAT 4/40	Rapid	7-1/4 O	13-1/2 AA	3 F
CAT 4/40	Medium	8-1/4 Q	14-1/4 CC	6 L
CAT 4/40	Slow	9-1/2 S	15-1/2 EE	9 R

DECISION ARCS
Westmoreland County
(Use Upper Neck Area Decision Arc Map)

<u>Storm Category/Forward Speed (in Knots)</u>	<u>Evacuee Response</u>	<u>Clearance Time in Hours/ Clearance Time Arc</u>
CAT 1-4/10	Immediate	1 A
CAT 1-4/10	Rapid	3-1/4 B
CAT 1-4/10	Medium	6-1/4 D
CAT 1-4/10	Slow	9-1/4 E
CAT 1-4/20	Immediate	1 A
CAT 1-4/20	Rapid	3-1/4 D
CAT 1-4/20	Medium	6-1/4 G
CAT 1-4/20	Slow	9-1/4 J
CAT 1-4/30	Immediate	1 B
CAT 1-4/30	Rapid	3-1/4 E
CAT 1-4/30	Medium	6-1/4 J
CAT 1-4/30	Slow	9-1/4 N
CAT 1-4/40	Immediate	1 B
CAT 1-4/40	Rapid	3-1/4 G
CAT 1-4/40	Medium	6-1/4 M
CAT 1-4/40	Slow	9-1/4 S

Figure 1.
STORM Overlay

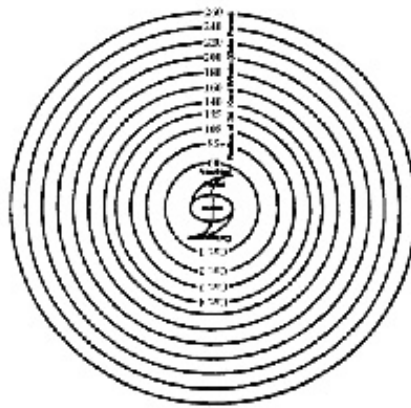
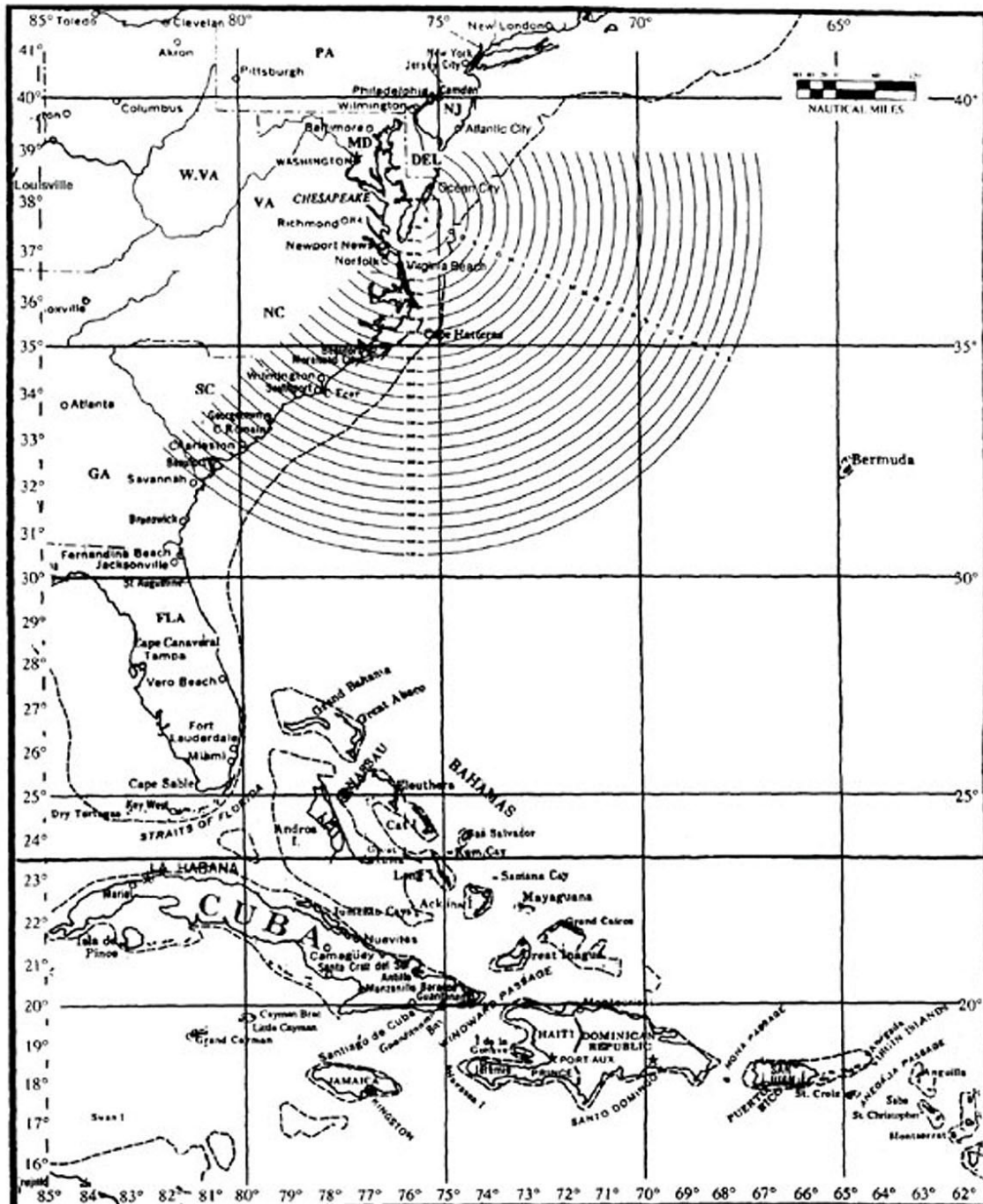
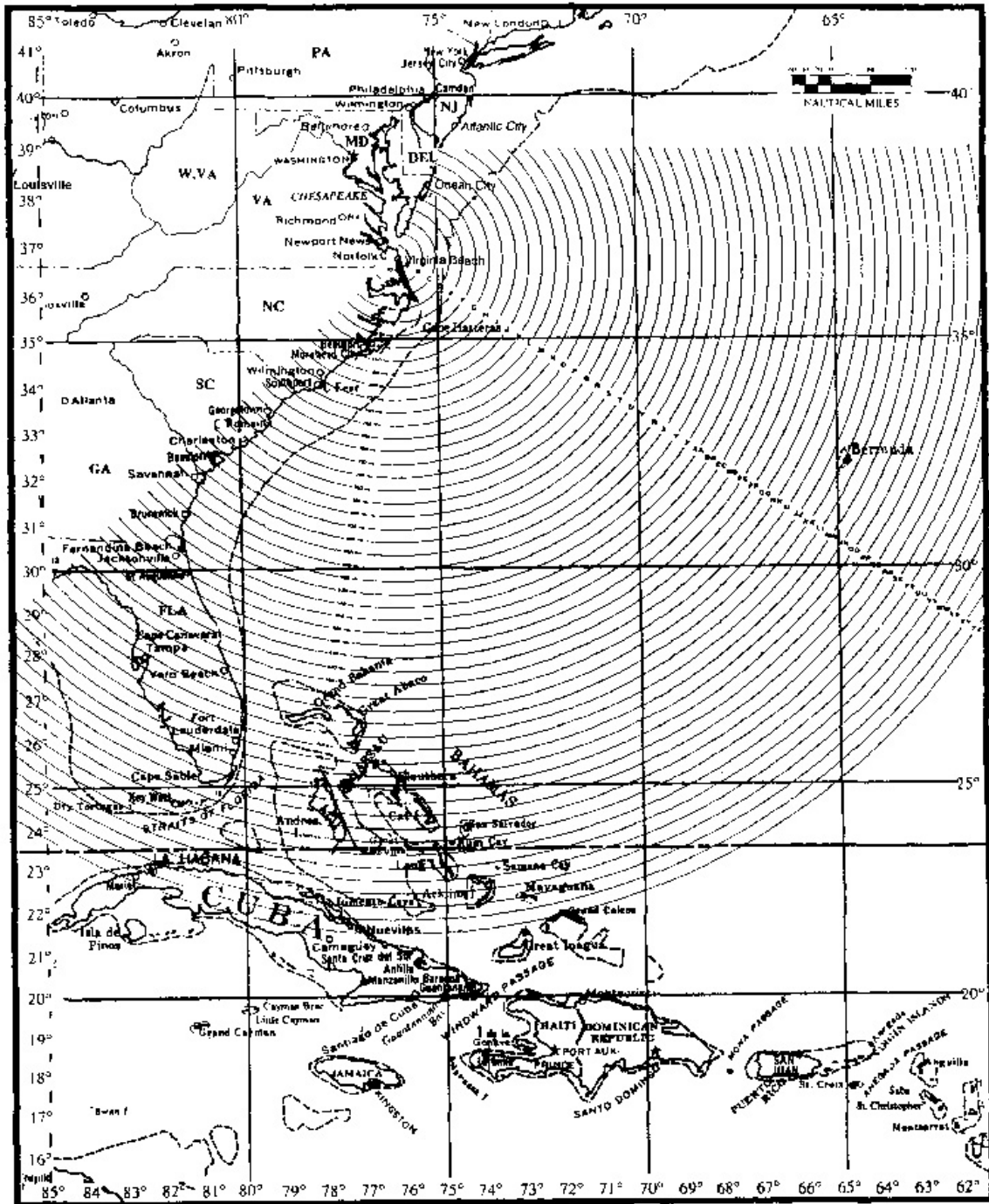


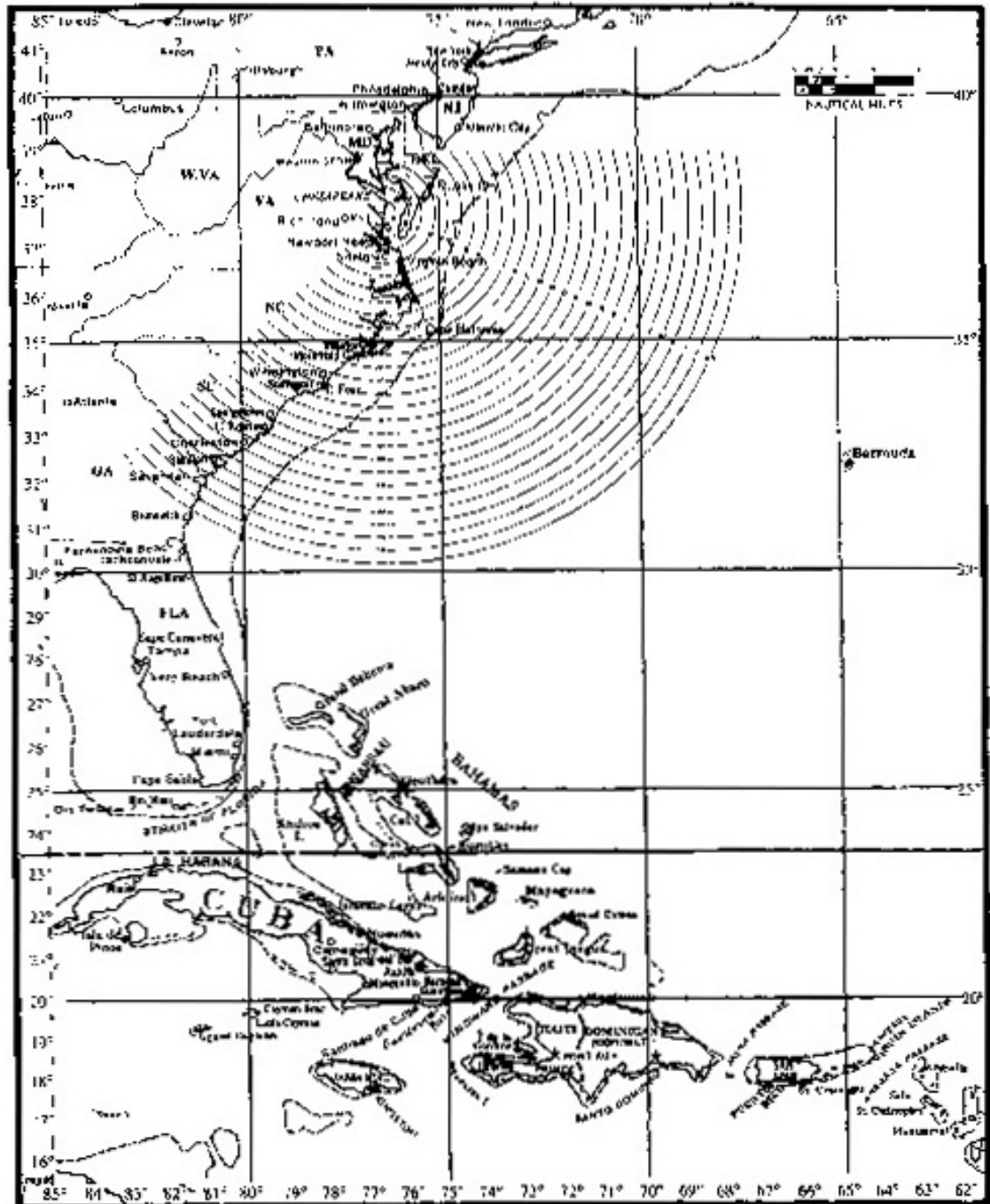
Figure 7-4. STORM Overlay



DECISION ARC MAP
VIRGINIA HURRICANE EVACUATION STUDY
Eastern Shore Area



DECISION ARC MAP
VIRGINIA HURRICANE EVACUATION STUDY
Tidewater Area



DECISION ARC MAP
VIRGINIA HURRICANE EVACUATION STUDY

Upper Neck Area

7-6

Figure 7-3

TIME CONVERSION TABLE

<u>DATE</u>	<u>ZULU TIME</u>	<u>EASTERN DAYLIGHT TIME</u>	
		<u>MILITARY TIME (24HR)</u>	<u>CIVIL TIME (AM/PM)</u>
1 ST	0500	(1 ST) 0100	(1 ST) 1 AM
	0600	0200	2 AM
	0700	0300	3 AM
	0800	0400	4 AM
	0900	0500	5 AM
	1000	0600	6 AM
	1100	0700	7 AM
	1200	0800	8 AM
	1300	0900	9 AM
	1400	1000	10 AM
	1500	1100	11 AM
	1600	1200	12 NOON
	1700	1300	1 PM
	1800	1400	2 PM
	1900	1500	3 PM
	2000	1600	4 PM
	2100	1700	5 PM
	2200	1800	6 PM
	2300	1900	7 PM
2 ND	0000	2000	8 PM
	0100	2100	9 PM
	0200	2200	10 PM
	0300	2300	11 PM
	0400	(2 ND) 0000	12 MIDNIGHT
	0500	(2 ND) 0100	(2 ND) 1 AM